

WHAT IS CLAIMED IS:

1. A semiconductor laser device comprising:

a semiconductor substrate;

5 a lower clad layer formed on the semiconductor substrate;

a lower guide layer formed on the lower clad layer;

an active layer formed on the lower guide layer;

an upper guide layer formed on the active layer; and

10 an upper clad layer formed on the upper guide layer,

wherein the lower and upper clad layers have the same refractivity, and the lower clad layer includes a high refractivity layer, spaced from the lower guide layer by a constant distance, with refractivity higher than that of the upper clad layer.

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2. The semiconductor laser device as set forth in claim

1,

wherein the high refractivity layer is spaced from the

20 lower guide layer toward the side of the substrate by at least a distance corresponding to half of the total thickness of the upper and lower guide layers and the active layer.

3. The semiconductor laser device as set forth in claim

25 1,

wherein the upper and lower guide layers have the same thickness.

4. The semiconductor laser device as set forth in claim
1,

wherein the upper and lower guide layers have the same
5 refractivity.

5. The semiconductor laser device as set forth in claim
1,

wherein the high refractivity layer is disposed between
10 the lower clad layer and the semiconductor substrate.

6. The semiconductor laser device as set forth in claim
1,

wherein the distance of the high refractivity layer
15 spaced from the lower guide layer toward the side of the
semiconductor substrate is less than 3 times as large as the
total thickness of the upper and lower guide layers and the
active layer.

20 7. The semiconductor laser device as set forth in claim
1,

wherein the high refractivity layer is disposed in the
lower clad layer.

25 8. The semiconductor laser device as set forth in claim
1,

wherein the active layer is made of an i-GaAs based

material, the upper and lower guide layers are made of an i-AlGaAs based material, the upper clad layer is made of a p-type AlGaAs based material, and the lower clad layer is made of an n-type AlGaAs based material.

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9. The semiconductor laser device as set forth in claim 1,

10 wherein the active layer is made of an i-AlGaAs based material, the upper and lower guide layers are made of an i-AlGaAs based material, the upper clad layer is made of a p-type AlGaAs based material, and the lower clad layer is made of an n-type AlGaAs based material.

15 10. The semiconductor laser device as set forth in claim 1,

wherein the high refractivity layer has Al content (wt%) of approximately 0.85 to approximately 0.97 times as much as Al content of the lower clad layer.

20 11. The semiconductor laser device as set forth in claim 9,

wherein the high refractivity layer has Al content (wt%) of approximately 1.3 to approximately 2.5 times as much as Al content of the lower guide layer.

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12. A semiconductor laser device comprising:
a semiconductor substrate;

a first lower clad layer formed on the semiconductor substrate;

a second lower clad layer formed on the first lower clad layer;

5 a lower guide layer formed on the second lower clad layer;

an active layer formed on the lower guide layer;

an upper guide layer formed on the active layer; and

an upper clad layer formed on the upper guide layer,

10 wherein the second lower clad layer and the upper clad layer have a first refractivity, and the first lower clad layer has a second refractivity higher than the first refractivity.

15 13. A semiconductor laser device comprising:

a semiconductor substrate;

first, second and third lower clad layers sequentially formed on the semiconductor substrate;

20 a lower guide layer formed on the third lower clad layer;

an active layer formed on the lower guide layer;

an upper guide layer formed on the active layer; and

an upper clad layer formed on the upper guide layer,

25 wherein the third lower clad layer and the upper clad layer have a first refractivity, and the second lower clad layer has a second refractivity higher than the first refractivity.

14. The semiconductor laser device as set forth in claim
13,

wherein the first lower clad layer has the same
5 refractivity as that of the third lower clad layer.

15. The semiconductor laser device as set forth in claim
13,

wherein the first lower clad layer has refractivity
10 higher than that of the third lower clad layer and lower than
that of the second lower clad layer.

16. The semiconductor laser device as set forth in claim
13,

15 wherein the first lower clad layer has refractivity
higher than that of the second lower clad layer and lower than
that of the lower guide layer.